

Appl. No. : 10/615,332
Filed : July 8, 2003

AMENDMENTS TO THE CLAIMS

1-11. (Canceled)

12. (Currently amended) A method for providing vapor phase reactant from solid or liquid source, comprising:

supplying a liquid comprising a precursor from a storage container to a vaporization chamber, the vaporization chamber being at a higher temperature than the storage container;

vaporizing the precursor in the vaporization chamber;

transporting the vaporized precursor to a reaction chamber;

conducting a vapor deposition process using the vaporized precursor in the reaction chamber;

draining unvaporized liquid from the vaporization chamber after conducting the vapor deposition process without opening the vaporization chamber;

returning the unvaporized liquid to the storage container; and

returning the unvaporized liquid to the vaporization chamber

wherein transporting comprises supplying pulses of the vaporized precursor to the reaction chamber alternately with pulses of at least one other precursor and stopping and allowing flow of the vaporized precursor from the vaporization chamber to the reaction chamber with an inert gas diffusion barrier and wherein stopping and allowing flow with an inert gas diffusion barrier comprises controlling valves for an inert gas flow outside of a hot zone accommodating the vaporization chamber.

13. (Original) The method of Claim 12, wherein the liquid is the precursor.

14. (Original) The method of Claim 13, wherein vaporizing comprises maintaining an unvaporized liquid in the vaporization chamber and generating vaporized precursor above the unvaporized liquid.

15. (Original) The method of Claim 12, wherein the liquid comprises a solid reactant source dissolved in a solvent.

16. (Original) The method of Claim 15, wherein vaporizing the precursor comprises vaporizing the solvent and vaporizing the solid reactant source.

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17. **(Original)** The method of Claim 16, wherein draining comprises providing solvent to the vaporization chamber to dissolve remaining solid reactant source and draining a resultant solution.

18. **(Canceled)**

19. **(Currently amended)** The method of Claim 12, wherein draining further comprises employing a pump.

20. **(Original)** The method of 12, wherein draining comprises removing the unvaporized liquid to a dedicated drain container.

21. **(Original)** The method of Claim 12, wherein the storage container is kept at a temperature at which the precursor is stable.

22. **(Original)** The method of Claim 21, wherein the vaporization chamber is kept at a vaporization temperature below the boiling point of the precursor.

23. **(Original)** The method of Claim 22, wherein transporting comprises flowing the vaporized precursor along conduits maintained at or above the vaporization temperature.

24. **(Original)** The method of Claim 22, wherein the vaporization chamber is maintained within a first hot zone in intimate contact with a second hot zone accommodating the reaction chamber.

25. **(Original)** The method of Claim 24, wherein the first hot zone and the second hot zone share at least some insulating elements.

26. **(Original)** The method of Claim 22, wherein the vaporization chamber and the reaction chamber are maintained within a single hot zone.

27-29. **(Canceled)**

30. **(Original)** The method of Claim 12, wherein the vapor deposition comprises atomic layer deposition.

31. **(Original)** The method of Claim 12, wherein draining is conducted at regular intervals between a predetermined number of depositions.

32. **(Original)** The method of Claim 12, wherein draining is conducted regularly between deposition runs after a predetermined period of time.

33. **(Original)** The method of Claim 12, further comprising periodically refilling the vaporization chamber with liquid from the storage container.

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34. **(Original)** The method of Claim 33, wherein periodically refilling comprises sensing a surface level of unvaporized liquid in the vaporization chamber has fallen below a predetermined level.